Fiber hit uniformity study

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Purpose and Goal

- Determine the variation of the fiber pulseheight and hit frequency for fibers in a single plane
- Find “dead” fibers

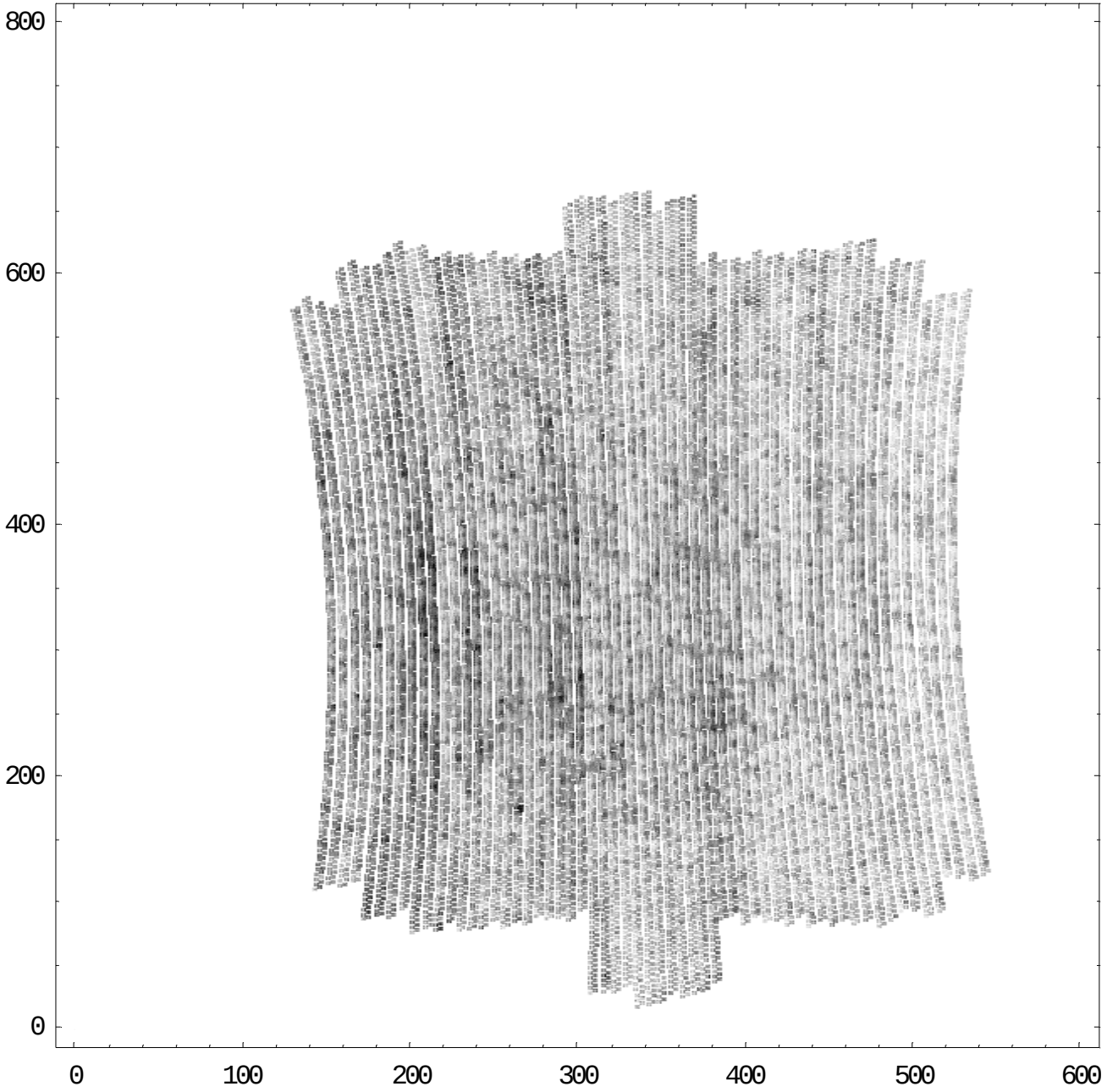
Method

- Loop over 400 .nustrip files and for all pixels belonging to a fiber:
  - find the average pixel pulseheight
  - find the maximum pixel pulseheight
- find the frequency with which this fiber is hit

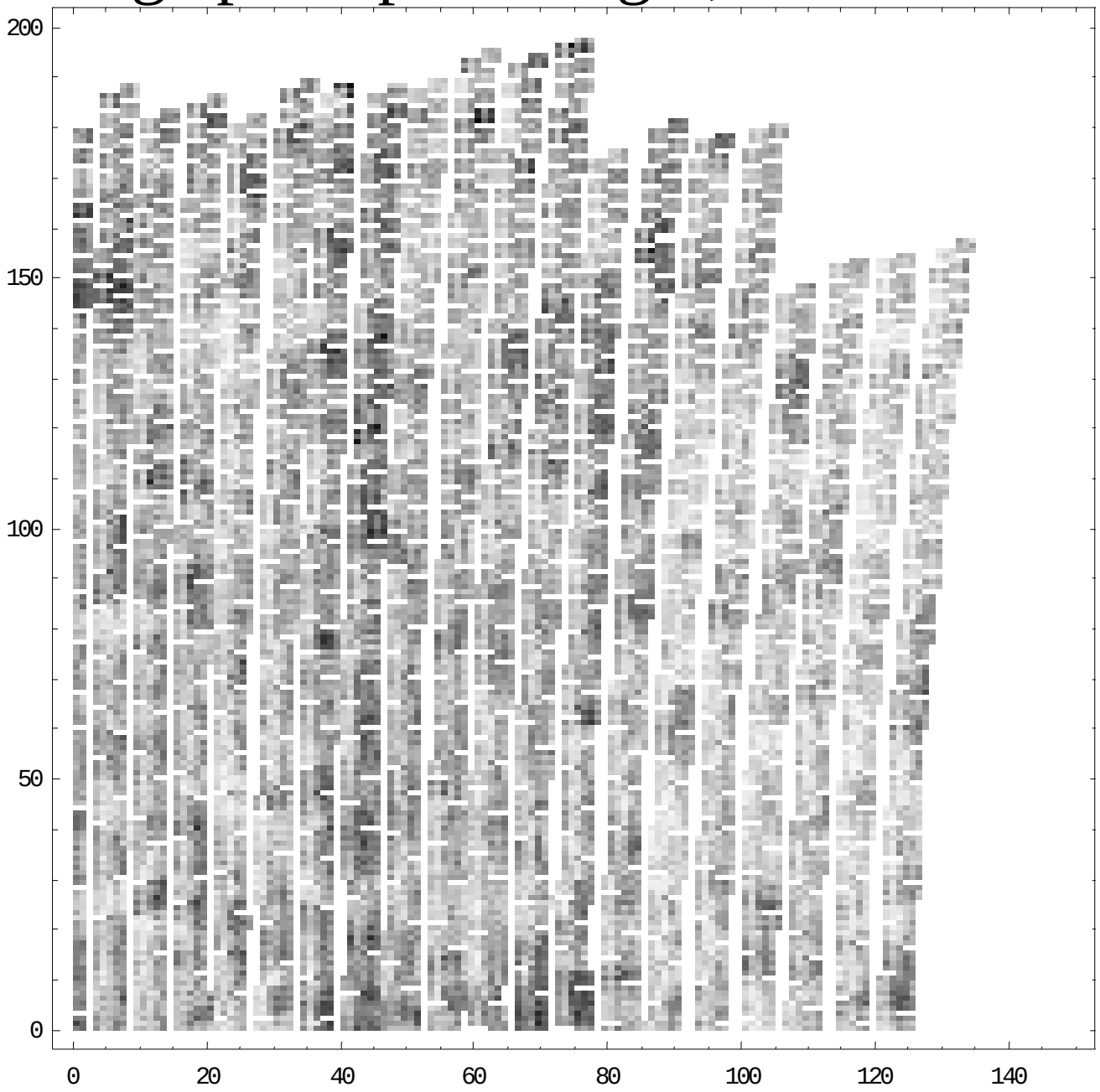
Plots

- Average pulseheight for pixels in one CCD image
- Frequency with which a fiber is hit
  - dead fibers are either always or never hit

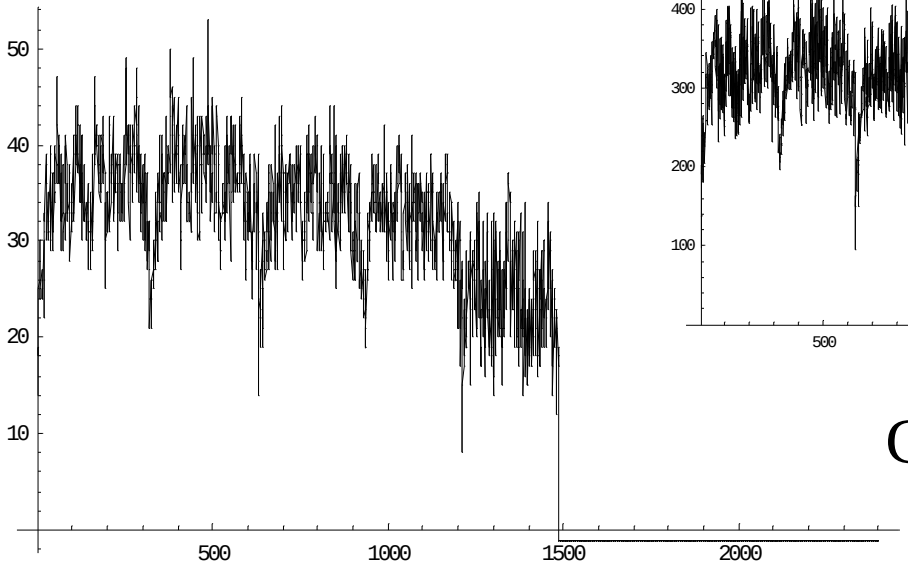
Average pixel pulseheight, CCD camera 0

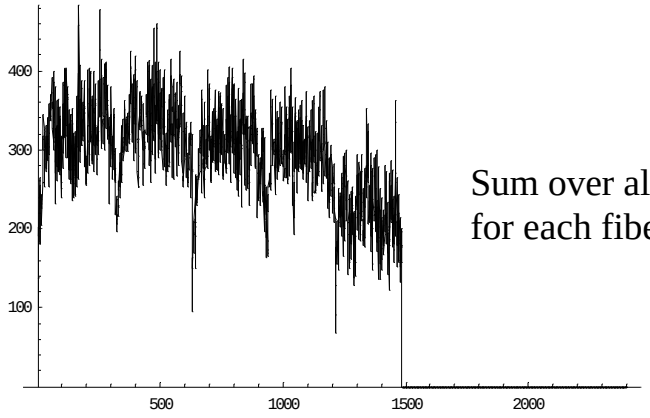


Average pixel pulseheight, CCD camera 0



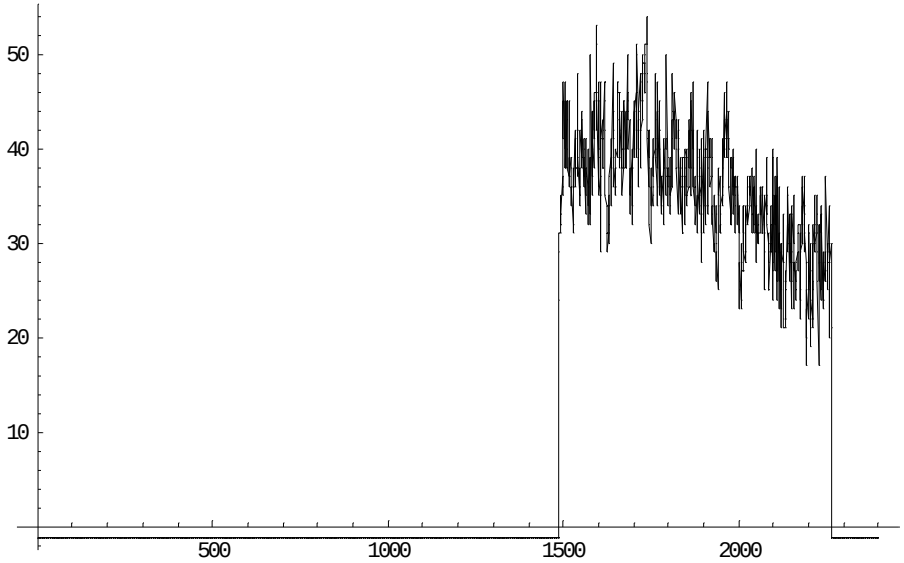
Number of times one pixel in a fiber is hit



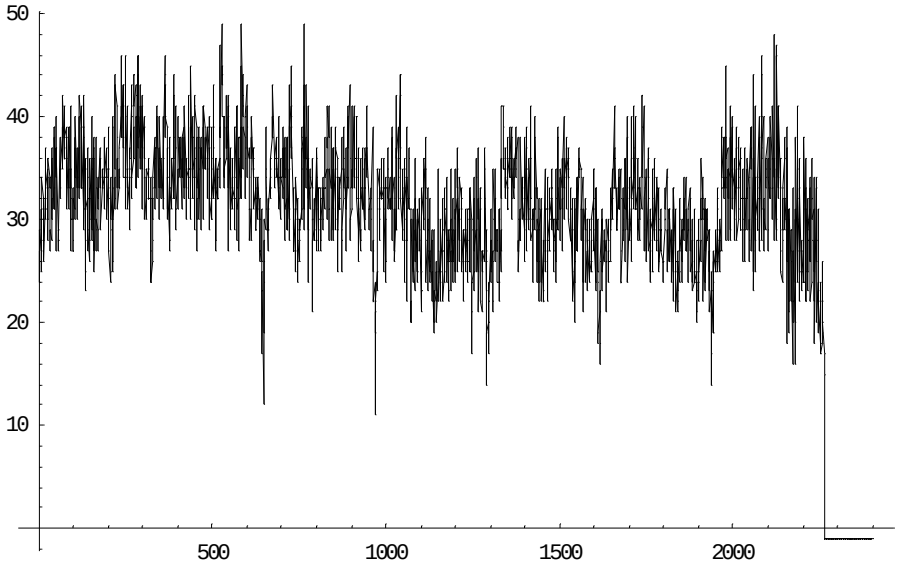


Sum over all pixels
for each fiber

CCD 0, plane 2 (U)



CCD 1, plane 2 (U)



CCD 0, plane 7 (U)

Spikes

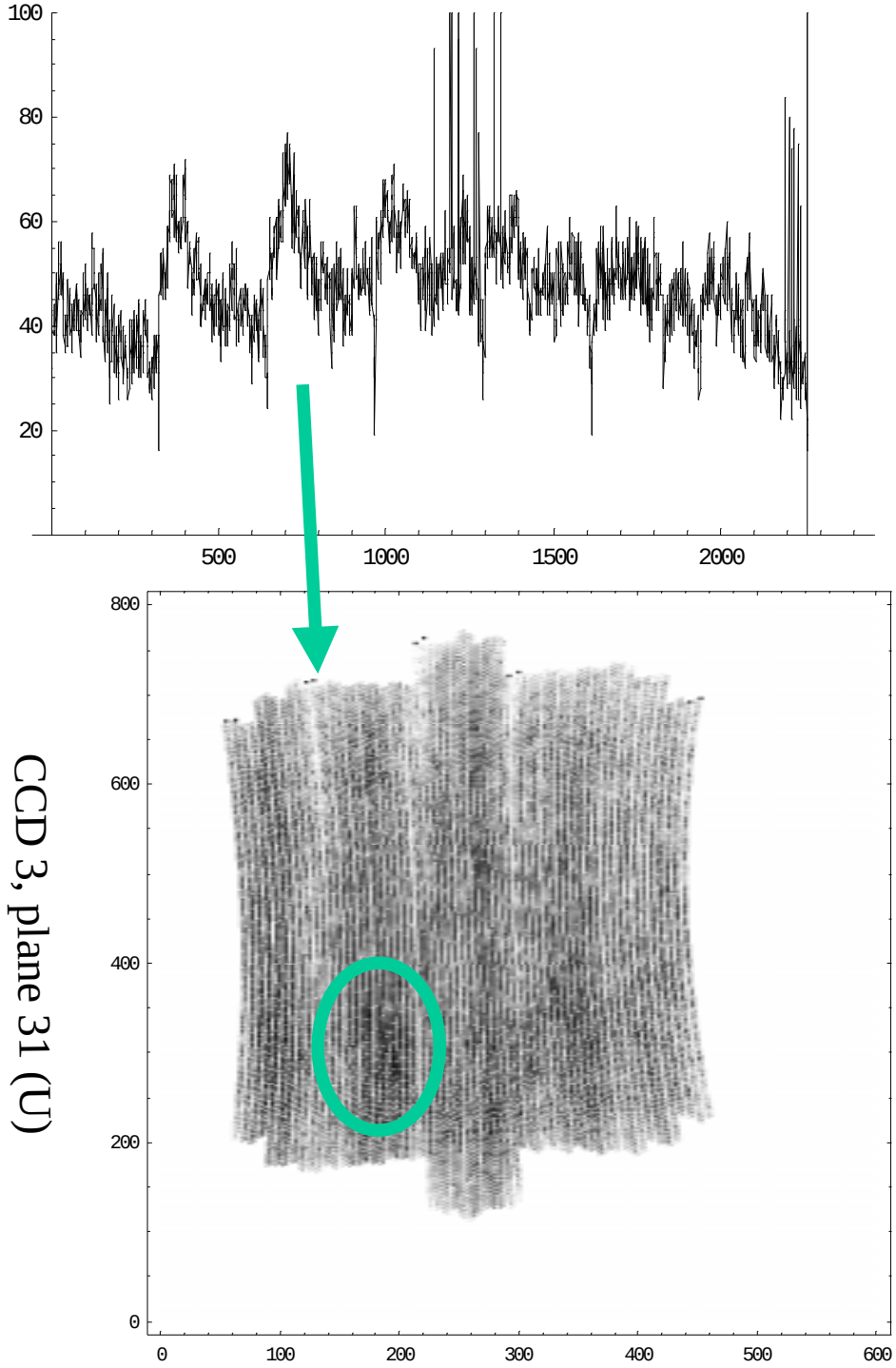
- Each figure shows several spikes to the bottom. These occur at the edge of a “paddle”.
  - The fiber at the edge only has neighbors to one side

→ expect half the count due to crosstalk

  - It makes no difference if all pixels are considered or only the ones with fiber hits.

Paddles

- Sometimes adjacent paddles show the same pattern
  - due to glue, IIT focussing, …



Conclusion and Outlook

- No regions with many dead fibers have been found in the SF system.
- Each fiber plane shows “features” that are a result of the paddle and IIT structure
- The variations within a single CCD camera are within a factor of four
  - has no effect on tracking
  - Each paddle has ~300 fibers (1% at the edge)
- No further studies are planned